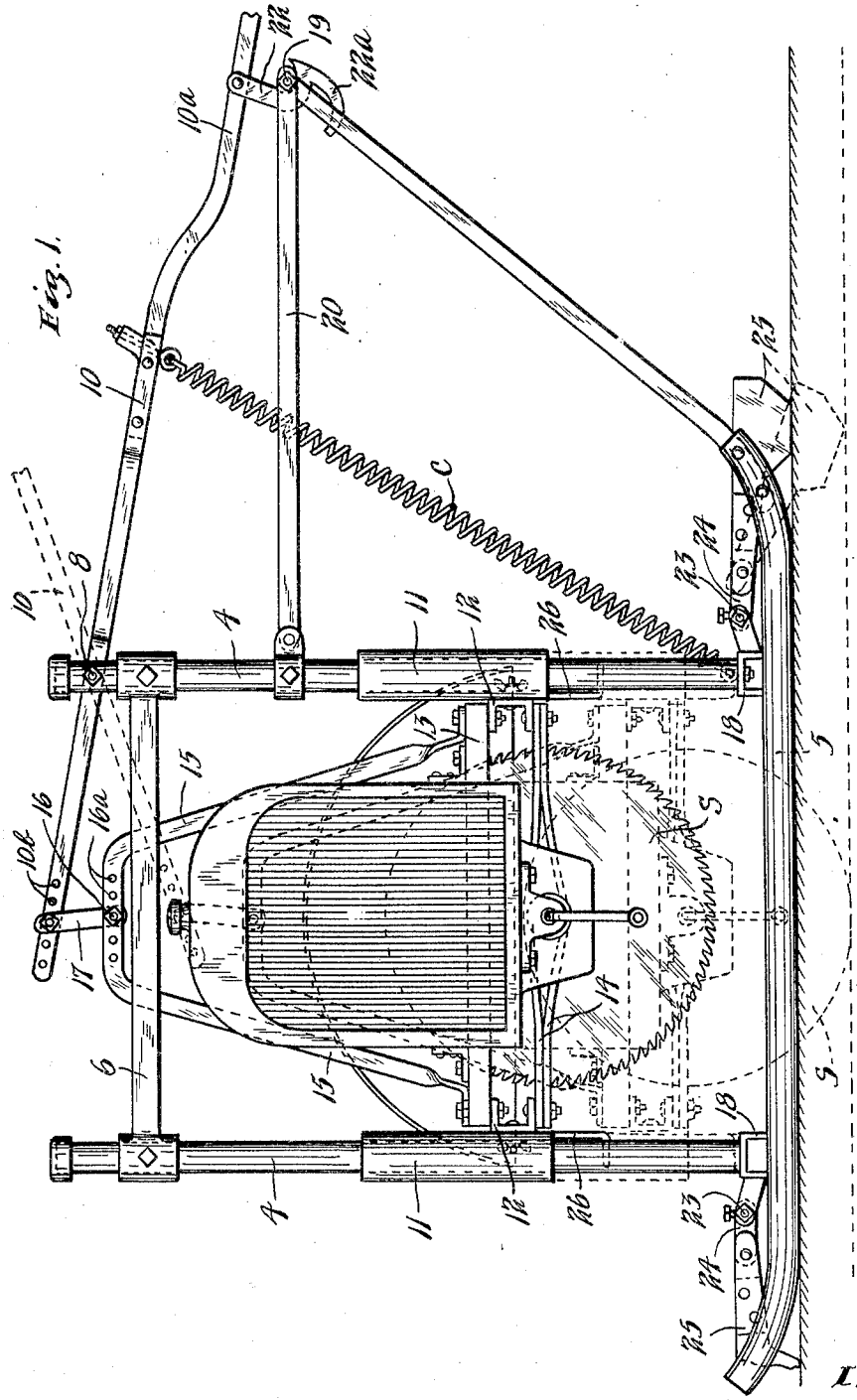
Oct. 15, 1929. N. D. SCHONS 1,731,872

ICE CUTTING MACHINE

Filed Feb. 15, 1928 2 Sheets-Sheet 1

Fig. 1.



INVENTOR.
NICHOLAS D. SCHONS
BY HIS ATTORNEYS.
Williamson & Williamson

Oct. 15, 1929. N. D. SCHONS 1,731,872

ICE CUTTING MACHINE

Filed Feb. 15, 1928 2 Sheets-Sheet 2

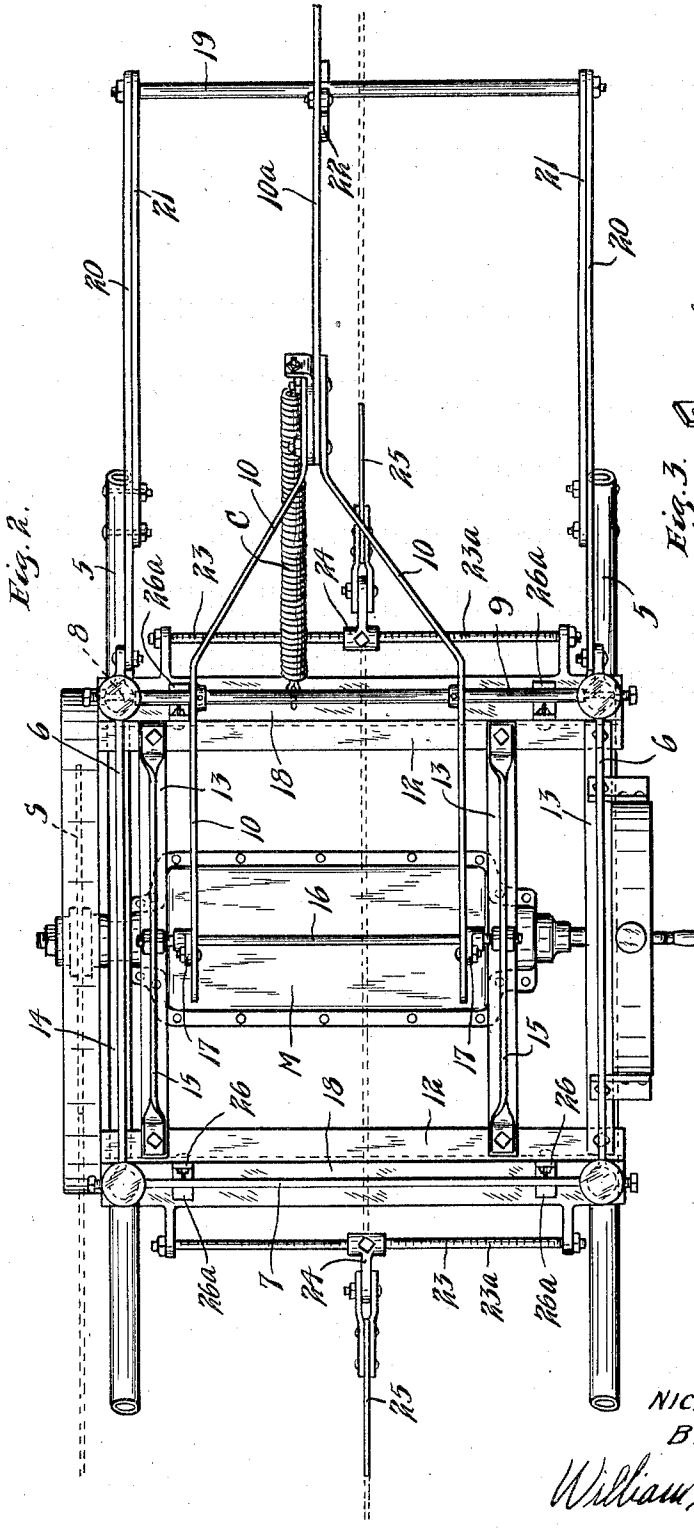


Fig. 2.

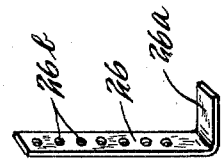


Fig. 3.

INVENTOR,
NICHOLAS D. SCHONS,
BY HIS ATTORNEYS.
Williamson Reid & Williamson

Patented Oct. 15, 1929 1,731,872

UNITED STATES PATENT OFFICE

NICHOLAS D. SCHONS, OF NICOLLET, MINNESOTA

ICE-CUTTING MACHINE

Application filed February 15, 1928. Serial No. 254,423.

This invention relates to machinery for cutting ice which is to be used for refrigeration purposes.

It is an object of my invention to provide an efficient power driven ice cutting machine which will have a high capacity for work and which may be easily and economically operated.

A further object is to provide an ice cutting machine having a power saw capable of vertical adjustment and adapted to not only cut the ice but moreover to propel, or assist in propelling the device over the ice as the ice is being cut.

Another object is to provide an ice cutting machine supported on runners and having mounted thereon a suspended motor provided with a circular saw, said motor being adjustable vertically to bring the saw into proper relation with the ice and the weight of said motor holding said saw in working position.

A still further object of the invention is to provide in connection with a machine of the class above described, efficient gauges for enabling a series of parallel cuts to be made in an area of ice, said cuts being spaced desired distances apart.

These and other objects will be apparent from the following description made in connection with the accompanying drawings, wherein like characters refer to similar parts throughout the several views and in which:—

Fig. 1 is a side elevation of an embodiment of the invention, the dotted lines indicating the position of certain parts when the device is in operation;

Fig. 2 is a plan view of the same; and

Fig. 3 is a perspective view of an adjustable stop member for limiting the downward position of the motor and saw.

As illustrated, I provide an upright frame which may comprise four posts indicated by the numeral 4, rigidly connected at their lower ends to a pair of spaced runners 5. The runners 5 may be constructed in any suitable manner, and as shown, comprise elongated tubular members having upturned extremities. Two of said posts 4 are secured to each of the runners 5 and said posts are rigidly connected together, adjacent their upper ends, by means of a pair of tie bars 6 extending parallel to runners 5, and a rear tie bar 7 disposed transversely of said runners. The forward posts 4 are rigidly connected together by means of a transverse horizontal rod 8 on which a tubular member 9 is mounted for oscillation, said tubular member extending between forward posts 4 and having rigidly connected therewith at its intermediate portion, an elongated bifurcated lever 10 provided with a forwardly extending handle portion 10^a.

A suitable motor indicated as an entirety by the letter M is slidably mounted on posts 4 as shown, said motor being rigidly connected with four vertical sleeves 11, one of said sleeves being telescoped over each of said upright posts 4. A pair of horizontal channel irons 12 extending transversely of the runners 5, may rigidly connect the forward and rearward pairs of sleeves 11 and the frame 13 of the motor may be rigidly secured to the upper flanges of said channel bars and additionally supported by means of bars 14 traversing the ends of the channel members 12 and rigidly secured to the lower flanges thereof. The motor M as illustrated has its driving axis disposed horizontally and transversely of the runners 5 and a suitable circular saw S is fixed to the extremity of the crank shaft of said motor, said saw being disposed in vertical position adjacent one side of the frame and extending in a plane parallel to runners 5.

Motor M is suspended from the inner end of bifurcated lever 10 and as shown, is provided with a pair of spaced upstanding inverted U-shaped straps 15, the lower ends of said straps being rigidly connected with motor frame 12, and the upper ends of said straps, being connected by a transverse tie rod 16, said tie rod spacing the upper ends of U-straps 15 a proper distance apart as well as reinforcing the same. The tie rod 16 is loosely connected to the bifurcated ends of the lever 10 by means of a pair of short links 17 and as shown, I provide a series of apertures 16^a in the upper horizontal portions of the two U-straps and a series of apertures 10^b adjacent the inner extremities of the bifurcated

arms of lever 10, whereby adjustment may be made in the connection between lever 10 and the suspension frame for the motor. A heavy coiled spring C is connected at its upper end to the forward portion of lever 10 and at its lower end is anchored to the channel members 18 or other transverse members which rigidly secure the posts 4 to the runners 5.

A suitable draft bar 19 is supported from runners 5 and the forward posts 4 by means of horizontal and obliquely extending bracing members 20 and 21 respectively, at each side of said frame, said bracing members intersecting at their forward ends and draft bar 19 securing said ends together and rigidly connecting the angular brace thus formed at each side of the machine. A depending hook 22 may be pivotally secured to the handle portion of bifurcated lever 10, said hook having a projecting camming portion 22^a by which locking engagement may be made between lever 10 and draft bar 19 when the handle 10^a is lowered. At the front and rear of my machine I provide, adjacent the base, horizontal gauge rods 23 which may be rigidly supported from the channels 18, said gauge rods each having thereon adjustable sleeves 24 provided with set screws, said sleeves having pivotally secured thereto the gauges 25. The gauges 25 are in the form of dogs, having vertical plates at their free ends, said plates being adapted to be disposed in a cut in the ice. Gauge rods 23 are each preferably provided with a series of graduations 23^a indicating the various distances at which sleeves 24 may be set from the saw S. The plates of gauges 25 are preferably inclined or rounded at their outer edges to permit disengagement of said plates with the ice when the machine is moved to the end of the cut.

At front and rear of the motor frame 13, I prefer to provide adjustable depending stops 26 having out-turned lower extremities 26^a adapted to abut the transverse base channels 18 to limit the downward position of the motor and saw. Stops 26 are each provided with a series of apertures 26^b through which bolts may be passed to adjustably and rigidly secure the stops to the vertical portions of channel irons 12 to which motor frame 13 is secured.

Operation

As shown, an internal combustion motor is provided, since the same can be economically run and since the same possesses adequate weight to cause the saw to be held against the ice when lever 10 is released, by disengaging hook 22 from the draft bar 19. It is, of course, understood that any suitable motor may be utilized, which will supply adequate power for causing the saw S to cut, and which will moreover possess sufficient weight to hold the saw against the ice.

In making the first cut in an area of ice, the motor is started and operating lever 10 is released and manipulated to lower the motor until saw S engages the ice. The coiled spring C counterbalances to some extent the weight of the motor M and also serves to cushion the drop of the saw against the ice, the tension of coiled spring C increasing as the saw approaches the ice. The adjustable stops 26 have been previously set to cause the saw to cut at the desired depth. The weight of the motor M and its mounting will yieldingly hold the saw against the ice and the rotation of the saw S being as shown in Fig. 1 in a clockwise direction, the machine will be moved in a direction indicated by the arrows in the drawings, by the action of the saw S. Ordinarily saw S is sufficient to propel the device over the ice, but if exceedingly thick ice is cut, a slight pull upon draft bar 19 will be sufficient to move the machine.

When the first cut has been completed, the operator depresses the handle portion of the lever 10, elevating the motor to disengage saw S from the ice. The gauges 25 may then be set the desired distance from the plane of the saw by adjusting sleeves 24 and the machine is then turned about on its runners 5 and the vertical plates of gauges 25 inserted in the first cut. The motor may again be lowered, sleeves 11 sliding on upright posts 4 until saw S is in contact with the ice. The machine will then travel in the opposite direction from its travel in making the first cut, and the second cut will extend parallel to the first cut. When a sufficient number of cuts are made, extending in one direction, the machine may be made to travel at right angles thereto, to cut the ice in lines intersecting said first mentioned series of cuts. The machine may be pushed back to starting position after each cut is made, or cuts at the left side of the area of ice may be made with the machine moving in one direction while cuts at the right side of the area may be made with the machine moving in the opposite direction. The saw is usually set so that one or two inches of ice is left below the cut and the blocks may be easily removed by chiselling the narrow amount of ice left at the bottom of the cut. The embodiment of the invention illustrated in the drawings will cut to a maximum depth of thirteen inches, although this depth is, of course, dependent upon the diameter of the saw. The depth of the cut may be easily adjusted by connecting stops 26 as desired, with the channel bars 12, while the space between parallel cuts may be varied by adjusting the gauges 25 with respect to the gauge rods 23, indications on said gauge rods readily enabling the operator to dispose the sleeves 24 in proper position.

The bifurcated lever 10 fulcrums on the front tie rod 8 and the handle portion is made of sufficient length to enable an operator to easily raise the motor and saw when the same is desired. The construction of the frame in

the slidable mounting of the motor on the upright posts thereof, provide a rigid support for the motor which will not vibrate excessively and the weight of the motor causes the saw to be held against the ice.

From the foregoing description it will be seen that I have provided a highly efficient machine which may be operated at low cost and which will have a maximum capacity for work. The rotary saw not only cuts the ice, but propels the machine across the ice as the cut is made, and the efficient gauges cause the next succeeding cut to extend exactly parallel with the first cut.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of the invention.

What is claimed is:

1. An ice cutting machine comprising a frame supported for movement over the ice said frame including a plurality of upright posts, a motor mounted for vertical sliding movement on said posts, a circular saw connected with the power shaft of said motor and rectilinearly movable with said motor, a suspension bracket secured to said motor and a lever pivoted to said frame and having its inner end connected to said suspension bracket to lift said motor from approximately its center of gravity, the weight of said motor being sufficient to hold the saw against the ice to be cut.

2. An ice cutting machine comprising a frame supported for movement over the ice, said frame including four spaced upright posts, a motor mounted between said posts and having four vertical sleeves connected with its base, said sleeves slidably engaging said posts, a circular saw fixed to the power shaft of said motor and extending in a vertical plane at one side of said frame, a suspension bracket straddling said motor and having a horizontal member disposed above the center of said motor, a lever pivoted to said frame on a horizontal axis having its outer end accessible from one end of said frame and having its inner end bifurcated and connected with the horizontal member of said suspension bracket, and means engageable with the outer end of said lever for retaining said motor in elevated position, the weight of said motor being sufficient to hold the saw against the ice.

3. The structure set forth in claim 2, and yielding means interposed between the outer end of said lever and said frame for counteracting to some extent the weight of said motor to facilitate elevation thereof by said lever.

4. An ice cutting machine comprising a pair of spaced runners, a frame including a plurality of spaced upstanding posts secured to said runners, a motor mounted between said posts and having slidable connections with said posts, means for elevating said motor through a vertical path, a saw drivably connected with said motor and movable rectilinearly therewith, the weight of said motor being sufficient to hold the saw against the ice and an adjustable stop member for supporting said motor and limiting the downward position thereof, said stop member being capable of rigid attachment to said frame in a plurality of different vertical positions.

5. An ice cutting machine comprising a frame supported for movement over the ice, said frame including a plurality of upright members, a motor mounted for vertical sliding movement on said upright members, a circular saw connected with the power shaft of said motor and rectilinearly movable with said motor, suspension means secured to said motor, a lever pivoted to said frame and having its inner end connected to said suspension means, whereby said motor may be lifted from approximately its center of gravity, the weight of said motor being sufficient to hold the saw against the ice to be cut, and an elastic element interposed between the outer end of said lever and said frame for counteracting to some extent the weight of said motor to facilitate elevation thereof by said lever.

In testimony whereof I affix my signature.

NICHOLAS D. SCHONS.